

22330

12425

03 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- a) Define lagging and leading.
 - b) Define power factor and state its formula.
 - c) Define quality factor of series resonance circuit.
 - d) State Kirchoff's voltage law.
 - e) Define node and branch.
 - f) State superposition theorem.
 - g) Write the equation for Y parameter.
2. Attempt any THREE of the following : 12
- a) What is power factor and state its significance. What is the condition for unity power factor.
 - b) Compare series and parallel resonance circuit.
 - c) Draw the star and delta connection. State conversion formula for any one.
 - d) State and explain Nortons theorem.
- P.T.O.

3. Attempt any THREE of the following :**12**

- a) Define and state equations for :
 - i) Active power
 - ii) Reactive power
- b) Draw a R–L–L series circuit and phaser diagram. Also write equations for condition $V_L > V_C$.
- c) Describe the meaning of term open circuit and short circuit with neat diagram.
- d) State and explain Thevenin's theorem with suitable example.

4. Attempt any THREE of the following :**12**

- a) A coil of resistance 10Ω and inductor 0.1 H is connected in series with a capacitor of $150\text{ }\mu\text{F}$ across 200 V , 50 Hz . Supply Calculate.
 - i) Inductive reactance
 - ii) Capacitive reactance
 - iii) Impedance
 - iv) Current.
- b) A single phase A.C. circuit containing resistor of 30Ω and inductor of 0.15 H are connected in parallel across 230 V , 50 Hz supply.
Determine –
 - i) Admittance
 - ii) Current
 - iii) Power factor
 - iv) Power
- c) If $Z_1 = 5 + j6$ and $Z_2 = 10 - j16$ are connected in parallel. Find the equivalent impedance of combination.

- d) Write equivalent star resistances for the given delta network for Figure No. 1.

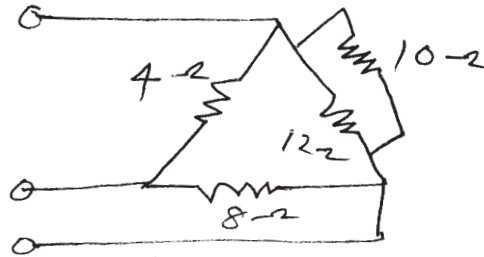


Fig. No. 1

- e) Find the current in 4Ω , resistance using superposition theorem for the circuit shown in Figure No. 2.

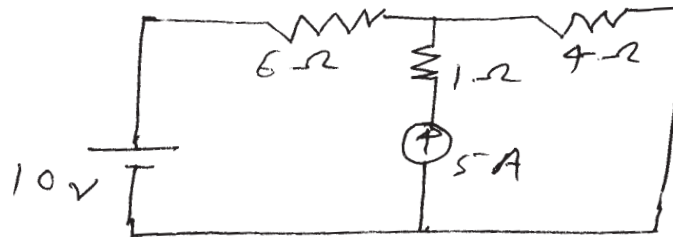


Fig. No. 2

5. Attempt any TWO of the following :

12

- a) Find the current I shown in Figure No. 3.

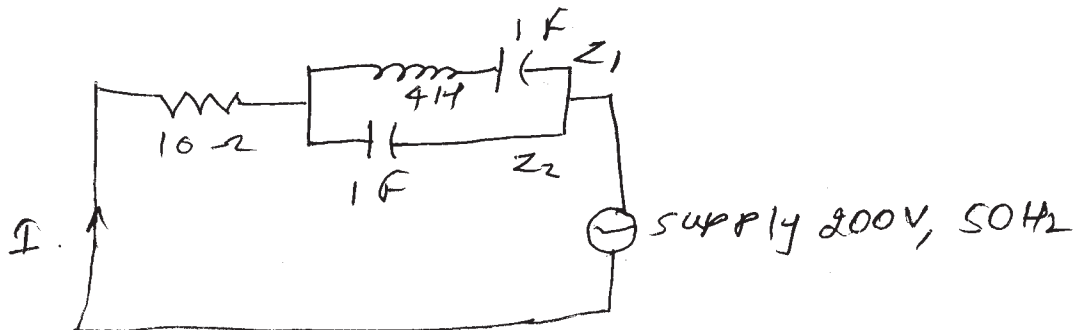


Fig. No. 3

- b) Find the Thevenin's equivalent circuit for the circuit shown in Figure No. 4.

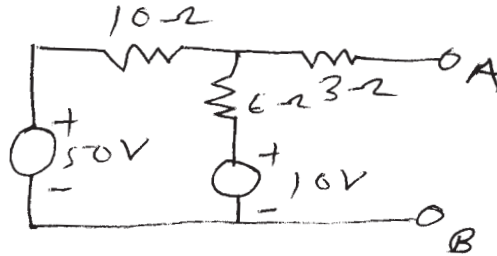


Fig. No. 4

- c) Obtain the Y-parameters of network shown in Figure No. 5.

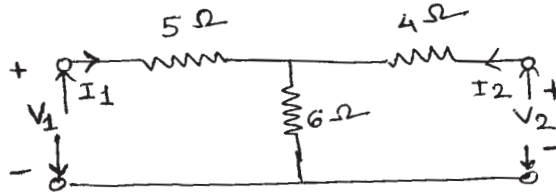


Fig. No. 5

6. **Attempt any TWO of the following :**

12

- a) Find the equivalent resistance between terminal A and B for a circuit shown in Figure No. 6.

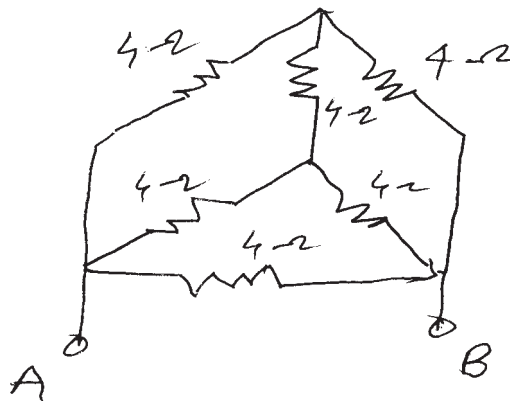


Fig. No. 6

- b) Using Norton's theorem calculate the current in the load resistance of the circuit shown in Figure No. 7

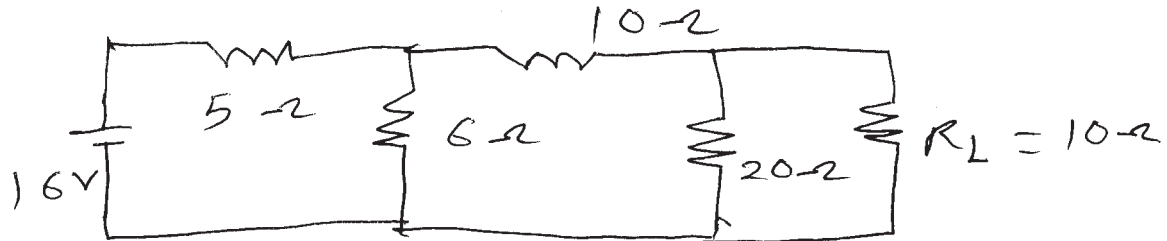


Fig. No. 7

- c) Find the ABCD parameters for the network shown in Figure No. 8.

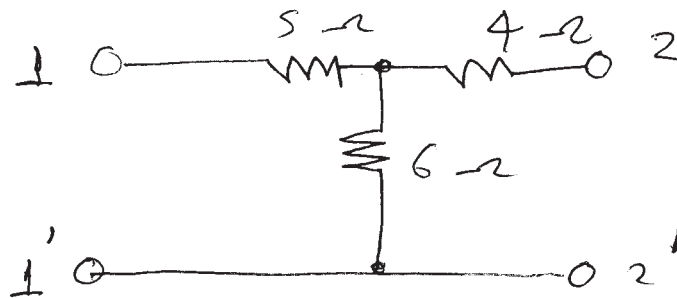


Fig. No. 8